

List of CLAIMS

This listing of claims will replace all prior version, and listings, of claims in the application:

Claims 1-17 (Canceled)

Claim 18 (Original): An image extraction apparatus comprising: image input means for inputting a plurality of images sensed under different image sensing conditions; image sensing condition control means for controlling the image sensing conditions of said image input means; recording/reproduction means for recording and reproducing the image sensing conditions of said image input means; image storage means for storing the images sensed by said image input means; image data comparison means for comparing at least a pair of image data of the plurality of images stored in said image storage means; initial contour setting means for setting an initial contour on the basis of a comparison result from said image data comparison means; background image region removal means for removing a background image region in the initial contour set by said initial contour setting means; and image cutting processing means for performing image cutting processing on the basis of an output from said background image region removal means.

Claim 19 (Original): The apparatus according to claim 18, wherein said background image region removal means comprises deformation/movement means for deforming and

moving the contour on the basis of a predetermined evaluation function value, and
convergence discrimination means for performing convergence discrimination on the basis of
the evaluation function value.

Claim 20 (Original): An image extraction apparatus comprising: image input means
for inputting a plurality of images sensed under different image sensing conditions; image
sensing condition control means for controlling the image sensing conditions of said image
input means; recording/reproduction means for recording and reproducing the image sensing
conditions of said image input means; image storage means for storing the images sensed by
said image input means; image data comparison means for comparing at least a pair of image
data of the plurality of images stored in said image storage means; selection/indication means
for selecting and indicating image data to be compared by said image data comparison means;
initial contour setting means for setting an initial contour on the basis of a comparison result
from said image data comparison means; image generation means for generating an image on
the basis of initial contour data set by said initial contour setting means; initial contour/initial
intra-contour image data correction means for correcting the initial contour and image data in
the initial contour; background image region removal means for removing a background
image region in the initial contour corrected by said correction means; and image cutting
processing means for performing image cutting processing on the basis of an output from said
background image region removal means.

Claim 21 (Original): The apparatus according to claim 18, wherein the image sensing conditions of said image input means include a focusing state or an in-focus level of an image, and said image sensing condition control means controls a layout of an imaging optical system arranged in said image input means.

Claim 22 (Original): The apparatus according to claim 18, wherein said image data comparison means outputs difference data of the plurality of images, and said initial contour setting means comprises representative point sequence extraction processing means for performing processing for extracting a representative point sequence of the difference data output from said image data comparison means.

Claim 23 (Original): The apparatus according to claim 18, wherein said image sensing condition control means sets a control width on the basis of a statistical amount of the plurality of images.

Claim 24 (Original): The apparatus according to claim 18, wherein said initial contour setting means comprises recursive setting means for recursively setting a local region having a predetermined point in the difference data as a center, and representative point sequence extraction processing means for performing processing for extracting a representative point sequence of the difference data in the local region.

Claim 25 (Original): The apparatus according to claim 18, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in a region of the object to be cut out, and contour tracing means for performing contour tracing having the contour point as a start point.

Claim 26 (Original): The apparatus according to claim 18, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 27 (Original): The apparatus according to claim 19, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position

search means as a start point.

Claim 28 (Original): The apparatus according to claim 20, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 29 (Original): The apparatus according to claim 21, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 30 (Original): The apparatus according to claim 22, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is

located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 31 (Original): The apparatus according to claim 23, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 32 (Original): The apparatus according to claim 24, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut out, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 33 (Original): The apparatus according to claim 25, wherein said initial contour setting means comprises contour point position search means for searching for a contour point position in a local region having, as a center, a predetermined point, which is located in the vicinity of a boundary between a background image region and an object to be cut, and is present in the background image region, and contour tracing means for performing contour tracing having the contour point position obtained by said contour point position search means as a start point.

Claim 34 (Original): An image extraction apparatus comprising: image sensing means for sensing a plurality of images; image sensing condition control means for controlling an image sensing condition when said image sensing means senses images; image sensing condition recording/reproduction means for recording the image sensing condition when said image sensing means senses images, and reproducing and outputting the recorded image sensing condition; image recording means for recording the plurality of images sensed by said image sensing means; image data conversion means for converting image data of at least one of the plurality of images on the basis of the image sensing condition supplied from said image sensing condition recording/reproduction means; image data comparison means for comparing the image data of the plurality of images converted by said image data conversion means; and image cutting means for extracting an image in a specific image region on the basis of a comparison result output from said image data comparison means.

Claim 35 (Original): The apparatus according to claim 34, wherein said image recording means temporarily stores a background image and an image including an object, in which an image to be cut out is present in a background, and said image data comparison means extracts difference image data of the plurality of images reproduced and output from said image recording means.

Claim 36 (Original): The apparatus according to claim 35, wherein said image sensing condition recording/reproduction means records an image sensing condition when an image to be cut out in a predetermined background is sensed, and said image data conversion means converts image data of the background image on the basis of the image sensing condition reproduced and output from said image sensing condition recording/reproduction means.

Claim 37 (Original): The apparatus according to claim 34, wherein said image recording means encodes and records the image data in the specific image region obtained by said image cutting means.

Claim 38 (Original): The apparatus according to claim 35, wherein said image recording means encodes and records the image data in the specific image region obtained by said image cutting means.

Claim 39 (Original): The apparatus according to claim 36, wherein said image recording means encodes and records the image data in the specific image region obtained by said image cutting means.

Claim 40 (Original): The apparatus according to claim 34, wherein said image data conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 41 (Original): The apparatus according to claim 35, wherein said image data conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 42 (Original): The apparatus according to claim 36, wherein said image data conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 43 (Original): The apparatus according to claim 37, wherein said image data conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 44 (Original): The apparatus according to claim 38, wherein said image data

conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 45 (Original): The apparatus according to claim 39, wherein said image data conversion means performs a space shift operation to maximize similarity between the background image and the image including the object.

Claim 46 (Original): The apparatus according to claim 34, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 47 (Original): The apparatus according to claim 35, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 48 (Original): The apparatus according to claim 36, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 49 (Original): The apparatus according to claim 37, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 50 (Original): The apparatus according to claim 38, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 51 (Original): The apparatus according to claim 39, wherein the image sensing condition includes an exposure amount, a focusing state, and the presence/absence of flash emission.

Claim 52 (Original): The apparatus according to claim 34, wherein said image data conversion means converts an image size, luminance level, color component, and resolution.

Claim 53 (Original): The apparatus according to claim 35, wherein said image data conversion means converts an image size, luminance level, color component, and resolution.

Claim 54 (Original): The apparatus according to claim 36, wherein said image data conversion means converts an image size, luminance level, color component, and resolution.

Claim 55 (Original): The apparatus according to claim 37, wherein said image data conversion means converts an image size, luminance level, color component, and resolution.

Claim 56 (Original): The apparatus according to claim 38, wherein said image data

conversion means converts an image size, luminance level, color component, and resolution.

Claim 57 (Original): The apparatus according to claim 39, wherein said image data conversion means converts an image size, luminance level, color component, and resolution.

Claim 58 (Original): A sensed image processing apparatus comprising: image sensing means; object distance detection means; template storage means; template size determination means for determining a size range of a template, which can be reduced/enlarged, on the basis of an output from said object distance detection means; and similarity evaluation means for evaluating similarity between a template within the size range and an image including an object.

Claim 59 (Original): The apparatus according to claim 58, wherein said template storage means stores a plurality of templates which are generated on the basis of images of an identical object viewed from different view point positions or directions.

Claim 60 (Original): The apparatus according to claim 58, wherein said image sensing means comprises a plurality of cameras, and said object distance detection means includes extraction processing of disparity or a disparity distribution between two images output from the cameras and object distance region extraction processing.

Claim 61 (Original): The apparatus according to claim 58, wherein said template size determination means determines a template size in a predetermined range on the basis of the object distance, size information of a specific object, and an optical parameter of said image sensing means.

Claim 62 (Original): The apparatus according to claim 58, wherein said similarity evaluation means generates a plurality of templates having different sizes within a range designated by said template size determination means on the basis of an output from said template storage means, and performs similarity evaluation between the templates and respective regions of images obtained by said image sensing means.

Claim 63 (Original): The apparatus according to claim 59, wherein said similarity evaluation means outputs motion information based on similarity evaluation between a plurality of templates associated with a specific object and respect to time-series images obtained by said image sensing means.

Claim 64 (Original): The apparatus according to claim 58, wherein said template storage means stores a plurality of different templates generated on the basis of images of different patterns generated upon movement of an identical object.

Claim 65 (Original): The apparatus according to claim 64, wherein said similarity

evaluation means performs similarity evaluation between time-series images obtained by said image sensing means and a plurality of templates associated with a specific object, and outputs corresponding information associated with a motion category or an action category of the object.

Claim 66 (Original): The apparatus according to claim 65, wherein said similarity evaluation means outputs information associated with a type of object and the action or motion category of the object on the basis of an order of a sequence of different templates which yield similarities higher than a predetermined threshold value or types of different templates which yield similarities higher than a predetermined threshold value as a result of similarity evaluation.

Claim 67 (Original): The apparatus according to claim 58, wherein said similarity evaluation means limits a similarity evaluation region in the image obtained by said image sensing means to a predetermined range on the basis of an output from said object distance detection means.

Claim 68 (Original): The apparatus according to claim 58, wherein said similarity evaluation means converts the template obtained from said template storage means into a plurality of templates having different resolutions, and performs similarity evaluation for respective regions in the image in an order of templates having lower to higher resolutions.

Claim 69 (Original): The apparatus according to claim 58, wherein said similarity evaluation means sets different weighting coefficients for similarity evaluation between a portion consisting of a specific color component in the template obtained from said template storage means and respective regions in the image.

Claim 70 (Original): The apparatus according to claim 58, wherein said template storage means stores an object image having a plain background or a background-less object image.

Claim 71 (Original): The apparatus according to claim 58, wherein said object distance detection means comprises electromagnetic wave radiation means or detection means, and detects an object distance on the basis of an electromagnetic wave detection signal reflected by or radiated from the object.

Claim 72 (Original): A sensed image processing apparatus comprising: image sensing means; template storage means; similarity evaluation means; means for encoding a template sequence obtained by matching evaluation of time-series images from said image sensing means with a plurality of templates in said similarity evaluation means; model code sequence (codebook) storage means; and collation means for collating the template sequence and a model code sequence.

Claim 73 (Original): An image input apparatus comprising: image sensing means for sensing an image for object extraction; image sensing mode setting means for setting an image sensing mode in which said image sensing means performs object extraction; image sensing parameter measurement control means for performing measurement and control of an image sensing parameter based on the image sensing mode set by said image sensing mode setting means; and recording means for recording the image sensing parameter and the image.

Claim 74 (Original): An image processing apparatus comprising: image sensing means for sensing an image for object extraction; image sensing parameter measurement control means for performing measurement control of an image sensing parameter based on a pre-set image sensing mode; recording means for recording the image sensing parameter and the image; image cutting processing means for cutting out an image by performing predetermined processing of images sensed and generated by said image sensing means under a plurality of image sensing conditions; control command communication means for performing a communication associated with a control command for controlling an image sensing operation of said image sensing means; and image transfer means for externally transferring image data generated by said image sensing means.

Claim 75 (Original): The apparatus according to claim 74, wherein said image sensing parameter measurement and control means controls the image sensing parameter on the basis of the control command supplied from said control command communication means.

Claim 76 (Original): The apparatus according to claim 73, wherein said image sensing mode setting means has an image sensing mode setting button and starts a setting operation of the image sensing mode upon operation of said image sensing mode setting button, and said image sensing parameter measurement and control means sets a control amount of the image sensing parameter on the basis of an image sensing parameter measurement value.

Claim 77 (Original): The apparatus according to claim 73, wherein said image sensing mode setting means automatically returns to a standard image sensing mode after said image sensing mode setting means sets a predetermined image sensing mode and fetches required images.

Claim 78 (Original): The apparatus according to claim 76, wherein said image sensing mode setting means automatically returns to a standard image sensing mode after said image sensing mode setting means sets a predetermined image sensing mode and fetches required images.

Claim 79 (Original): The apparatus according to claim 74, wherein said image cutting processing means comprises comparison data generation means for generating comparison data between a plurality of images having different image sensing parameters, and

processes an image to be cut out on the basis of the comparison data generated by said comparison data generation means and the control command supplied from said control command communication means.

Claim 80 (Original): The apparatus according to claim 73, wherein said image sensing parameter measurement and control means comprises lens layout control means for controlling a lens layout of an imaging optical system on the basis of a signal from said image sensing mode setting means, focusing level detection means for detecting a focusing level, and fetching signal generation means for generating a signal for fetching a plurality of images having different focusing Levels on the basis of an output from said focusing level detection means.

Claim 81 (Original): The apparatus according to claim 76, wherein said image sensing parameter measurement and control means comprises lens layout control means for controlling a lens layout of an imaging optical system on the basis of a signal from said image sensing mode setting means, focusing level detection means for detecting a focusing level, and fetching signal generation means for generating a signal for fetching a plurality of images having different focusing levels on the basis of an output from said focusing level detection means.

Claim 82 (Original): The apparatus according to claim 77, wherein said image sensing parameter measurement and control means comprises lens layout control means for controlling a lens layout of an imaging optical system on the basis of a signal from said image sensing mode setting means, focusing level detection means for detecting a focusing level, and fetching signal generation means for generating a signal for fetching a plurality of images having different focusing levels on the basis of an output from said focusing level detection means.

Claim 83 (Original): The apparatus according to claim 73, wherein said image sensing parameter measurement and control means comprises fetching signal generation means for controlling an exposure condition by controlling a shutter speed, an aperture diameter of an optical stop, or a characteristic value of an image sensor on the basis of a signal from said image sensing mode setting means, and generating a signal for fetching a plurality of images having different exposure conditions.

Claim 84 (Original): The apparatus according to claim 73, wherein said image sensing mode setting means can set a priority order of image sensing parameters.

Claim 85 (Original): The apparatus according to claim 73, wherein said image recording means stores a video signal before signal processing, and comprises a plurality of high-speed image recording means and image transfer means.

Claim 86 (Original): The apparatus according to claim 73, wherein said image recording means comprises image compressing/encoding means corresponding to a moving image or a still image, and can vary a compression method in correspondence with a type of extracted image in the image sensing mode for object extraction.

Claim 87 (Original): The apparatus according to claim 74, wherein said cut image processing means comprises an image cutting processing unit for cutting out an image from time-series images, and image tracking means for tracking the time-series images using the cut image obtained by said image cutting processing unit as initial data.

Claim 88 (Original): The apparatus according to claim 73, wherein said image sensing parameter measurement and control means operates in accordance with a basic control program written in storage means built in said image input apparatus main body or a detachable recording medium.

Claims 89-90 (Canceled)

Claim 91 (Original): A sensed image processing apparatus comprising: image sensing means having image sensing parameter control means for controlling an image sensing parameter, and image sensing mode setting means for setting an image sensing mode; calculation means having first image processing means for calculating comparison data

between a plurality of images each having the controlled image sensing parameter, and second image processing means for classifying an image region by discriminating the calculated comparison data; and terminal means having data communication means for performing a data communication with said image sensing means, wherein said image sensing parameter control means controls the image sensing parameter on the basis of a signal from said terminal means or a signal from said image sensing mode setting means.

Claim 92 (Original): A sensed image processing apparatus comprising: image sensing means having image sensing parameter control means for controlling an image sensing parameter, and image processing means for calculating comparison data between a plurality of images each having the controlled image sensing parameter; calculation means having indication/selection means for indicating an object position in the image; and terminal means for performing a data communication with said image sensing means, wherein said calculation means generates an image sensing parameter control signal on the basis of an object position signal from said indication/selection means and image data in a predetermined size region having the position as a center, said image sensing parameter control means controls an image sensing condition on the basis of the image sensing parameter control signal, and said terminal means extracts a specific object image by processing an image obtained under the image sensing condition.

Claim 93 (Original): The apparatus according to claim 91, wherein said image

sensing parameter control means controls the image sensing parameter to perform an image sensing operation having a region with a substantially uniform predetermined feature amount of image data as a center.

Claim 94 (Original): The apparatus according to claim 91, wherein said data communication means comprises synchronization means for transferring image data in synchronism with said image sensing means, and said calculation means processes image data received via said data communication means.

Claim 95 (Original): A sensed image processing apparatus comprising: image sensing means having finder display means; image display means for displaying an image sensed by said image sensing means; indication/selection means for indicating an image displayed on said image display means; and calculation means having region discrimination processing means for discriminating a region of the indicated image, wherein said region discrimination processing means processes image data sensed by said image sensing means, and performs cutting processing having a position or region in an image frame output from said indication/selection means as a center, and said image display means or said finder display means displays an extracted image signal from said calculation means.

Claim 96 (Original): A sensed image processing apparatus comprising: image sensing means having image sensing parameter control means for controlling an image

sensing parameter, and memory means for storing sensed image data; image display means for displaying an image sensed by said image sensing means; indication/selection means for indicating the displayed image; calculation means having region discrimination processing means for discriminating a region of the indicated image; and terminal means having data communication means for performing a data communication with said image sensing means, wherein said image sensing parameter control means receives control data from said terminal means via said data communication means or from said memory means, said region discrimination processing means calculates comparison data between a plurality of images sensed under at least two image sensing conditions including a standard image sensing condition and a non-standard image sensing condition set by said image sensing parameter control means, and performs cutting processing having a position or region in an image frame output from said indication/selection means as a center, and said image display means displays an image signal output from said calculation means.

Claim 97 (Original): The apparatus according to claim 91, wherein said data communication means comprises transmission/reception means of a signal by means of electromagnetic waves or a line, and communication procedure control means, and said apparatus further comprises image sensing mode setting means for setting an object extraction image sensing mode on the basis of command data received from said terminal means via said data communication means.

Claim 98 (Original): The apparatus according to claim 91, further comprising memory means having recording/reproduction means for recording/reproducing image data on/from a detachable memory medium, and wherein said memory medium holds image sensing operation control sequence data in an object cutting image sensing mode in a header portion.

Claim 99 (Original): The apparatus according to claim 91, further comprising memory means having recording/reproduction means for recording/reproducing image data on/from a detachable memory medium, and wherein said image sensing parameter control means sets an image sensing condition and performs an image sensing operation on the basis of image data read out after said memory medium is loaded into said memory means.

Claim 100 (Original): The apparatus according to claim 91, further comprising memory means having recording/reproduction means for recording/reproducing image data on/from a detachable memory medium, and wherein said memory means records camera operation information in an object extraction image sensing operation, and said image sensing mode setting means or said terminal means reproduces the camera operation information.

Claim 101 (Original): A sensed image processing method comprising: the image sensing step including the image sensing parameter control step of controlling an image sensing parameter of an image sensing apparatus and the image sensing mode of setting an

image sensing mode; the calculation step including the first image processing step of calculating comparison data between a plurality of images each having the controlled image sensing parameter, and the second image processing step of classifying an image region by discriminating the calculated comparison data; and the data communication step of performing a data communication between said image sensing apparatus and a terminal device, wherein the image sensing parameter control step includes the step of controlling the image sensing parameter on the basis of a signal from said terminal device or a signal set in the image sensing mode setting step.

Claim 102 (Original): A sensed image processing method comprising: the image sensing step including the image sensing parameter control step of controlling an image sensing parameter of an image sensing apparatus and the image processing step of calculating comparison data between a plurality of images each having the controlled image sensing parameter; the calculation step of indicating an object position in the image using an indication/selection device; and the data communication step of performing a data communication between said image sensing apparatus and a terminal device, wherein the calculation step includes the step of generating an image sensing parameter control signal on the basis of an object position signal from said indication/selection device and image data in a predetermined size region having the position as a center, said image sensing parameter control step includes the step of controlling an image sensing condition on the basis of the

image sensing parameter control signal, and said terminal device extracts a specific object image by processing an image obtained under the image sensing condition.